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# WHAT BIOLOGY HAS CONTRIBUTED TO RELIGION

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*We always think in terms of our education. Sometimes education comes from our daily work without special schooling; sometimes it comes from highly developed training in universities. Speaking generally, our theologies have been built up by university men. In the course of time these theologies have moved out over an entire society and thus people come to think religiously in terms of the best thought in the educational world.*

*Until very recent years the great interests of the world outside of religion have been war, commerce, and metaphysics. Naturally the material of theology was drawn from these sources. But within the last two or three generations the scientific spirit has been overwhelmingly developed. Unfortunately very few of our theological writers have had any thoroughgoing scientific training. For that reason they have failed to get help for their theology from the various sciences which are really at their disposal. Henry Drummond is one of the outstanding exceptions to this general condition.*

*This article by Professor Coulter is one of a general group which will appear at intervals during the next few months, setting forth the contribution of science to religious thought. It is hoped that they will enable our readers to grasp the theological possibilities of scientific conceptions, and they will serve to help the positive movement toward a more vital theology.*

It cannot be claimed that it has been any part of the purpose of biological investigation to make a contribution to religion. It has been concerned only in discovering the facts of plant and animal life, and in formulating laws based upon these facts. In so far as these facts and laws have a bearing upon religion, biology may be said to have contributed to religion, but only as two distinct bodies of fact and belief inevitably react upon one another when they overlap. That religion and biology are consistent is evidenced by the fact that they are so regarded by those who have given attention to both. They seem inconsistent only to those who have

given attention to one of them and have no real knowledge of the other.

It is not necessary, in this connection, to define religion with great exactness. Perhaps no definition can be formulated that would seem fair or complete to every type of mind and belief. For our present purpose it seems sufficient to say that it involves a strong sense of obligation, and that it overlaps biology when this obligation involves the development of the most efficient types of men and women. Efficiency in this connection means the development of the maximum physical, mental, and spiritual capacities.

The religious impulse is so universal a possession that it must be reckoned with

among the other human impulses, and its significance in human nature should be understood. From the point of view of a biologist, rational obedience to this impulse results in the best type of development, which means not only the highest development of natural capacities, but chiefly the best balance of these capacities. For example, the religious impulse does not express itself fully in a trained body or in a trained mind, but in the subordination of the trained body and mind to the trained spirit. This is the most effective balance of one's powers, concerning which there is no serious discussion, and it is the peculiar function of religion to establish it. It is this perfect balance of highly developed capacities that makes Jesus the ideal type of manhood. It is upon this aspect of religion, which means the proper conduct of one's life, that biology has reacted so strongly that it may be said to have made contributions.

In association with the physical sciences it has developed a point of view that has revolutionized our habits of thought. This point of view has been called "the scientific spirit," but it is an attitude of mind that is not peculiar to the so-called sciences; it has merely been strongly developed by the growth of physical and biological investigation. It now permeates all investigations, and is the animating spirit of any investigator in any subject. It was inevitable that this same spirit should permeate all real thought concerning religion. The effect of this has been happy or unhappy, dependent upon one's point of view, but it was inevitable. To those who prefer to have religion freed from what may be called its fetish-like appendages, and

developed as a definite body of fundamental laws, the result has seemed a great gain. It is far more attractive to thinking people to work under a set of principles than under a set of rules, for principles apply to all situations, while rules can never be inclusive enough. This contribution to religion cannot be credited to biology alone, but it seems to be a fitting introduction to the contributions peculiar to biology.

A fundamental contribution of biology that has reacted favorably upon religion is the increasing body of knowledge in reference to the effects of conduct upon the welfare of the human body. So long as proper personal conduct is a religious demand only, it is observed only by those strongly dominated by the religious impulse, and even with them the pressure of personal interest is rather vague and distant. But when this religious demand is reinforced by a biological demand, proper conduct is observed even by many who are not dominantly religious, and upon even those who are religious the pressure of personal interest becomes more definite and immediate.

It is a very significant fact that the rules of conduct for the best development of men, discovered first by the experience of the human race, and afterward formulated as religious precepts, have now been established as laws by biology. This does not mean that biology deserves credit for the discovery, but that experience, religion, and biology can now combine in enforcing proper conduct; that what was thought to be only a religious precept, deserving the attention only of church members who had pledged themselves to obedience, is

also a biological precept, as necessary to obey as any other law of Nature; that the penalty of disobedience is not doubtful and distant, but certain and immediate. In short, the appeal for proper conduct has been made stronger not only for those who would be religious in any event, but also for many who otherwise would not be religious at all. It is not necessary to cite the personal habits involved in proper conduct, for they are familiar to all who are likely to read this paper.

Passing from the more general reactions of biology upon religion to the more special, the recent intensive work upon heredity must be considered. This work reacts upon religion because it has to do with the welfare of the human race, including its moral welfare. Heredity is the most important and the most difficult problem of biology. It has passed from the stage of crude observation and inference to the stage of rigidly controlled experiment. It follows that there are some things we really know about heredity, but this knowledge has brought into view, as never before, the vast stretches of ignorance that remain to be filled in with knowledge. We must also distinguish sharply between the things we know and the general conclusions we have based upon them, which are at best our present working hypotheses.

We know that certain things are likely to be inherited and other things not. For example, certain diseases of the parent are likely to be transmitted to the child; while an "acquired character," such as a scar or a lame leg, is not transmitted. We know, also, that heredity transmits not only similarity

but also dissimilarity, and this dissimilarity results in what we call individuality. No two human beings are exactly alike, and it is this fact that frees a child more or less from the fatality of its parents. Otherwise, heredity would be a machine-like expression of predestination, and human responsibility would have been reduced long since to a minimum.

When such facts of heredity as body-resemblances, physical diseases, etc., were extended in imagination to include moral diseases or "tendencies," the subject of heredity entered the field of religion; and a terrible burden of responsibility was laid upon parents. The responsibility of parents cannot be exaggerated, but this particular form of responsibility was exaggerated for a time. The result of this feeling of responsibility in connection with heredity led to the development of what is called the science of eugenics, but as yet it is more of a religion than a science. The whole subject of inheritance, as heredity is better called, is too extremely complex to permit safe generalizations as yet, so that any proposed measures in the interest of eugenics, except such as deal with inheritable diseases, may be wide of the mark.

To appreciate this situation, and also to realize that inheritance is full of hope as well as of danger, a brief statement in reference to the machinery of heredity is necessary. The living substance, called protoplasm, is the most potential substance known. It has expressed its possibilities in the infinite variety of structures and forms it has produced among plants and animals. This living substance is organized into minute

structural units called cells, millions of which make up the human body. The bodies of the simplest plants and animals consist of a single such unit, and of course this single cell has the power not only to do the work connected with living, but also to reproduce. As the bodies of plants and animals become many-celled, some of the cells lose the power of reproduction, but retain other powers. In the higher plants and animals most of the cells have lost the power of reproduction, but it is these comparatively few reproductive cells that have retained all the original powers of a living cell. Reproductive cells, therefore, are not specialized cells, but they are the only generalized cells of a complex body, the only cells that have retained the primal powers. It is the muscle cells, or nerve cells, or bone cells that are specialized, not the reproductive cells. This fact is important to remember, for it means that a reproductive cell is not narrowly limited in its possibilities, but that it may express itself in the greatest variety of ways.

When fertilization occurs, two of these very potential reproductive cells unite to form a single new cell, the fertilized egg, and this egg produces the child. Each of the reproductive cells that enters into this union contains the accumulated inheritances from a long line of ancestors, and the combination may well be regarded as a new one; at least it did not exist in either of the parents. Among all the possibilities, or perhaps better capacities, thus locked up in the protoplasmic egg, which ones will get expression? The responsibility of parents, so far as heredity is concerned, ends just here; that is, they are respon-

sible for the limits set to the possibilities of the child, for the child can develop no other capacities than those it has received. It must be remembered, however, that the parents possessed many possibilities that remained undeveloped; in fact, it is certainly true that no one of us has called upon more than a small fraction of the possibilities we have inherited. It follows that the child may develop very different possibilities from those developed by either parent; for example, pious parents may produce a renegade child; and from a drunken home there may issue an upright child. In the former case the child certainly inherited the possibility to develop into a righteous life; and in the latter case the child just as certainly inherited the possibility to develop into a drunkard; but in neither case, for some reason, were the possibilities developed by the parents the same as those developed by the child.

If parental responsibility, so far as inheritance goes, consists only in limiting the number and character of the capacities transmitted, what determines the selection of the capacities for cultivation? It is this second factor that eugenics is in danger of forgetting, in its eagerness to see that the parents are "fit." It is evident that they may be unfit so far as their own development is concerned, but at the same time they are very likely able to transmit capacities that are very fit for development. This second factor, that determines the selection of capacities, may be expressed by the single word *opportunity*. Inheritance determines the number and character of capacities, but opportunity selects those that are to develop. This

second factor does not lighten the burden of parents, but gives great hope to the child. It means that the child is not doomed to one form of inheritance, but that so long as its capacities can be stimulated by opportunity, it may respond by development in any direction.

It is this second factor that furnishes a scientific basis for the claim of religion that no man is past hope on account of his inheritance, or even on account of his previous development. It is certainly a factor recognized by Jesus, for he never seems to have lost his confidence in the possibilities of men.

With such facts at hand, the activities of religion in connection with eugenics become clear.

1. The responsibility of parents in the matter of inheritance when it includes heritable diseases is evident and should be enforced. The maximum danger from such inheritance, however, is not avoided by safeguarding marriage. The far more subtle form of this danger comes from the social evil, on account of which thousands who may be fit when married become unfit afterward.

2. The responsibility of parents in the matter of inheritance in connection with undesirable tendencies should be taught persistently, for the evidence is clear that a strongly developed tendency in a parent may be the easiest tendency to develop in the child.

3. The most important part of the Christian program, however, is to see to it that every child shall have the chance to respond to a stimulating opportunity. This will save thousands where the regulation of marriage will save one. It means a regulation of homes as well as of marriages. It makes the responsibility of parents continuous, and at the same time it puts responsibility upon the child. In a certain sense, this has always been the Christian program, but not in the wide sense that these laws of inheritance and development suggest. It involves much more than Sunday schools and the instruction of Sunday schools, for it includes the total exposure and interests of children.

This program is a larger one than the present movement for eugenics has suggested. In fact, this movement is limited at present to the obvious things that might be accomplished by legislation. But the joint demand of religion and of biology is not limited by the possibilities of legislation. The only organizations equipped to undertake such a campaign are those into whose field it belongs naturally. The Christian organizations have the opportunity to add the practical suggestions of biology to their own great motive, and to transform eugenics so that it may really be another effective form of religion.